

CHAPTER 2 - BACKGROUND

This chapter provides background information regarding the existing wastewater and drainage system in the project area, combined sewer overflows (CSOs), and the regional plans for CSO reduction. The chapter ends with a discussion of proposed projects and plans in the vicinity of the project area with potential for cumulative impacts.

2.1 EXISTING SEWER AND DRAINAGE SYSTEM IN PROJECT AREA

Before Metro was formed in 1958, no wastewater treatment was provided for most Seattle wastewater, which was discharged to Puget Sound and Elliott Bay as untreated sewage and as CSOs. Suburban areas had separate sewerage systems with small treatment plants discharging to lakes and rivers. After Metro was formed, major interceptors were constructed to convey all wastewater to a few large treatment plants. Dry-weather overflows of untreated sewage were eliminated and discharge of treated wastewater to the freshwater lakes and rivers in the Lake Washington basin was discontinued.

Ownership, operation and responsibilities for the sewerage system in the project area are split between two agencies. Seattle Public Utilities is responsible for the sewage collection system serving areas up to 1,000 acres in size. King County Wastewater Treatment Division is responsible for sewer trunks serving areas greater than 1,000 acres and for treatment plants. Seattle's system feeds into King County's system. King County's conveyance pipelines are larger in diameter than Seattle's conveyance facilities.

When storms occur, both Seattle's and King County's pipes can overflow. The overflows from Seattle's system are usually smaller in volume and shorter in duration than the overflows from King County's system. Seattle's overflows occur more during peaks in stormwater runoff, while the larger King County pipes, which carry wastewater from larger areas, are more sensitive to both stormwater runoff and wastewater flows. King County pipes tend to overflow for longer periods during and after storms.

Total baseline CSOs for the project area are approximately 506 million gallons (MG) annually (405 MG from Denny Regulator, 15 MG from Dexter Regulator, and 86 MG from Seattle's Lake Union CSOs) (see Table 1-2).

2.1.1 Areas Tributary to the Denny Regulator

The areas draining to the Denny Regulator are as follows (Figure 2-1):

Denny Local. The area north of Denny Way and east of Elliott Avenue West to about Queen Anne Avenue is called Denny Local and is made up of dense residential and some commercial and industrial properties. It includes about 211 acres of combined sewer area. The Denny Way Regulator Station has a separate overflow weir and regulator gates for Denny Local flows.

Figure 2-1

Denny/Lake Union. Combined sewage from the areas east of the Seattle Center to Interstate 5 is carried to the east portal of the existing Lake Union Tunnel, located at Terry Avenue and Republican Street. The tunnel conveys flows under the Seattle Center to the Denny Way Regulator Station. The tunnel also collects flows from the Western Avenue and lower Queen Anne areas at its west end. It is an urbanized area with a high percentage of impervious surface. The Denny/Lake Union Basin has a combined service area of approximately 1000 acres, however, the area to the east of Interstate 5 tributary to Seattle CSO 126B are not included in the project.

East Lake Union. The area extends east of Lake Union and north of Mercer Street to the top of Capitol Hill. This area, containing about 554 acres of combined sewer system, contributes CSO flows to the east end of the existing Lake Union Tunnel. Land uses within the area include residential, commercial and industrial. The basin is densely developed and has eight existing Seattle CSO outfalls, which discharge into Lake Union.

Two other areas are not tributary to the Denny Regulator basin but these flows would also be conveyed in the proposed CSO control system (see Figure 2-1):

Central Trunk. This area lies between various portions of the Denny/Lake Union basin from approximately Galer Street south to Madison Street. It is a highly urbanized area that flows into the Central Trunk. During high flow periods, overflows occur at the Dexter Regulator into Lake Union. Overflows at the Dexter Regulator (15 MG annually) will be reduced by the Denny/Lake Union Project.

Vine Street. The Vine Street Basin is located along the waterfront west of the Denny/Lake Union Basin from Bell Street to Vine Street. It is comprised of high-density residential and commercial properties. Vine Street Basin contributes combined sewer flows to the EBI upstream (south) of the Denny Way Regulator Station. Seattle is responsible for flows from this area. Flows from Vine Street would be accounted for within the peak flows in the Denny/Lake Union Project; however, a separate project by Seattle would be undertaken to convey approximately 16 mgd of flows to the Elliott West site.

2.1.2 King County's Sewer System in the Project Area

Figure 2-2 shows the major sewer system components around the Lake Union and Denny basins. King County provides conveyance of Seattle flows to the Denny Way Regulator Station via the existing Lake Union Tunnel. Seattle and King County systems join at the mouth of the existing Lake Union Tunnel at the intersection of Terry Avenue North and Republican Street. The existing brick tunnel was found to be in good shape for its age (100 years) in a study by Brown and Caldwell and Metro (1989). In that study, it was recommended that Metro continue monitoring the condition of the tunnel and reline it when point repairs would no longer insure structural integrity. In the same study, it was acknowledged that the existing tunnel has insufficient capacity, which makes relining undesirable. Construction of a parallel tunnel for CSO storage and conveyance would allow future relining of the brick structure so that it could then be used for extra storage and conveyance capacity. (The new Mercer Street Tunnel could serve as a parallel tunnel.)

Figure 2-2

The EBI is an 8.5-foot diameter pipeline running along the Seattle waterfront. It is the only pipe that collects and conveys sewage from the area between Elliott Bay, Norfolk Street, Lake Washington, and the ship canal to the West Point Treatment Plant via the Interbay Pump Station and North Interceptor. When the EBI is at capacity, overflows occur at outfalls all along Elliott Bay and the Duwamish River. The Denny Way CSO is the last overflow point for the EBI before the Interbay Pump Station.

At the west end of the existing Lake Union Tunnel, CSOs from the south along Western Avenue also flow to the Denny Way Regulator Station, which regulates flow into the EBI when capacity is available. The regulator stores CSOs in the tunnel when the interceptor is full and then discharges CSOs to Elliott Bay when the tunnel reaches capacity. King County's Denny Local Regulator exists in the same structure, regulating flows to the EBI from the area immediately adjacent to and north of the station (the Denny Local Basin).

Overflows can occur at the Denny Way CSO discharge under a variety of conditions, depending on the rainfall pattern in the Seattle area. Most commonly, overflows occur when the existing Lake Union Tunnel and Denny Local systems are full to capacity, and it is impossible to discharge flows to the EBI because it is already full. In addition, overflows from the EBI can occur when its flows exceed the pumping capacity of the Interbay Pump Station. On average, overflows occur about 50 times per year, and currently discharge about 450 million gallons (MG) per year to Elliott Bay. The Denny Way CSO is the largest CSO in the King County System.

King County's Central Trunk conveys flows from part of the downtown area, passing over the existing Lake Union Tunnel, to the Dexter Regulator, where it is regulated into the lower part of the trunk. When the Central Trunk is full, an overflow weir and pipe downstream of the Dexter Regulator convey overflows into Lake Union, discharging about 15 MG annually.

2.1.3 Seattle's Sewer System in the Project Area

The trunk sewer around Lake Union was constructed in the early 1900s when the lake shores were partially wooded, population density was lower, and much of the basin was undeveloped. The piping was sized to carry the storm flows only as far as the next overflow and spill into Lake Union. Figure 2-3 shows major components of Seattle's sewer system in east and south Lake Union. Seattle's CSO #125 and CSO #175 are located in southeast Lake Union.

CSO #125. The CSO #125 overflow weir is located at the intersection of Fairview Place North and Fairview Avenue North. The outfall, a 24-inch pipe discharging at the shoreline, was replaced in 1988. A total of 70 acres are tributary to CSO #125, with 25 acres upstream of the overflow weir. The other 45 acres are tributary to the east Lake Union sewer trunk, which discharges to the King County existing Lake Union Tunnel. When the tunnel and/or the trunk is full, excess flow from this area discharges at CSO #125. Approximately 3.2 MG per year discharge annually from CSO #125 into Lake Union.

CSO #175. The tributary area to this overflow is 69 acres in size. There is a constriction immediately downstream of the overflow weir. The CSO #175 overflow weir was built at the bottom of a steep slope at the intersection of Lakeview Boulevard and the East Prospect Street

Figure 2-3

right-of-way. Extreme turbulence at the overflow manhole is present even during dry weather flow resulting in frequent overflows. CSO #175 overflows into the I-5 storm drain system where 36-inch and 42-inch diameter pipes connect it to an outfall at East Garfield Street. The annual average overflow volume from CSO #175 is approximately 9.6 MG.

2.2 SEATTLE METROPOLITAN AREA COMBINED SEWER OVERFLOWS

2.2.1 The Combined System

Seattle, like most major cities in this country, was developed before the turn of the century. Because combined systems were the standard engineering practice of the time, all of Seattle's sewers built from 1892 until the early 1940s were combined sewers (combination of stormwater and sanitary flows). The upper illustration in Figure 2-4 provides a graphic representation of a combined sewer system. Engineers designed combined sewers to remove horse manure, runoff and garbage from city streets, as well as to convey household sewage. However, sewer systems built since the 1950s use a dual network of pipes known as a separated sewer system (see lower portion of Figure 2-4). In the separated system, stormwater is conveyed separately from household, commercial and industrial wastewater. Approximately two-thirds of Seattle is still served by a combined sewer system.

During periods of heavy or prolonged precipitation, the combined volume of wastewater flows and stormwater runoff may exceed system capacity. CSOs serve as safety valves for the sewer system by allowing discharge of a mixture of untreated sewage and stormwater runoff at or near the shoreline during periods of high flows due to storms. To prevent damage to wastewater treatment plants and conveyance facilities, and to prevent sewers from backing up into homes and offices, combined sewers are designed to overflow at designated points. Typically, those overflow points are to marine waters and rivers, where the flushing action of tides and currents can disperse pollutants. However, overflows are sometimes located so that they discharge into lakes, where less dispersion occurs.

Seattle has CSOs from the local system and King County has CSOs from the large collection system. Seattle and King County overflows occur along the shorelines of Lake Washington, Lake Union, the Lake Washington Ship Canal, the lower Duwamish River, Elliott Bay, Longfellow Creek, and along the West Seattle shoreline. King County and Seattle have an agreement designating ownership of each CSO outfall (Figure 2-5). During the 1981-83 baseline period, nearly 2.4 billion gallons of untreated sewage were discharged from the King County system annually, with Seattle discharging an additional unknown volume. As a result of control efforts by both agencies over the past 15 years, the combined volume of overflows has been significantly reduced. Even with the reductions achieved, about 1.8 billion gallons per year of combined sewage overflowed the King County system plus an additional unknown volume from the Seattle system in 1994.

2.2.2 CSO Control

CSOs are a recognized source of water pollution. Overflows can result in aesthetic degradation of shorelines during CSO events and impact sediment quality at discharge points. In addition, CSOs may

Figure 2-4

Figure 2-5

raise public health concerns in areas where there is potential for public contact because they release disease-causing bacteria, viruses and toxic chemicals into area waterways. CSOs have contributed to shellfish harvesting restrictions, beach closures, and even occasional fish kills.

The objective of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), also known as the Clean Water Act, is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Since the mid-1970s, EPA has provided joint planning and funding for CSO control projects.

In 1989, EPA’s Office of Water issued a National Combined Sewer Overflow Control Strategy (54 Federal Register 37370) which reaffirmed that CSOs are point source discharges subject to National Pollutant Discharge Elimination System (NPDES) permit requirements and to Clean Water Act requirements. The CSO Strategy charged all States with developing state-wide permitting strategies designed to reduce, eliminate, or control CSOs. In 1994, EPA published a CSO Control Policy (59 Federal Register 18688) to provide guidance, ensure coordination, and ensure public involvement. In expectation of EPA’s planned issuance of the CSO Control Strategy in 1989, Ecology supported the 1985 Legislature’s enactment of RCW 90.48.480. That statute requires all Washington municipalities with CSOs to develop plans to “achieve the greatest reasonable reduction of combined sewer overflows at the earliest possible date.” Chapter 173-245 WAC, adopted by Ecology in 1987 to implement RCW 90.48.480, defines “the greatest reasonable reduction” of CSOs to mean control of CSOs such that an average of one untreated discharge may occur per year. Both Seattle and King County (first as Metro) have been actively engaged in CSO control programs since the 1960s. In 1988, Metro and Seattle adopted CSO control plans to meet this water quality goal of “the greatest reasonable reduction of combined sewer overflows at the earliest possible date.”

The various documents describing initial agency CSO control programs and updates adopted by Seattle and King County are listed in Appendix A. These documents serve as the comprehensive planning and environmental documentation basis for individual projects. The CSO comprehensive plans are updated with each NPDES permit renewal; King County’s was updated in 1995. Project-level designs, engineering reports and environmental documents are completed before project construction.

King County issued a draft wastewater comprehensive plan called the Regional Wastewater Services Plan (RWSP) on May 7, 1997, and the Executives Preferred Plan in April 1998. This plan discusses system-wide service strategies for CSO control as well as wastewater treatment, pipeline systems, and markets for biosolids and wastewater reuse. Section 2.6.1 provides a description of the RWSP.

2.3 REGIONAL CSO REDUCTION PLANNING PROCESS

Metro’s first CSO plan following the Clean Water Act was its *1979 CSO Control Program Report* (Metro 1979). This Metro study, done in conjunction with Seattle’s CSO planning, evaluated CSO control for a range of rainfall conditions using a variety of control methods. Metro’s 1979 program recommended a combination of storage and treatment facilities. Seattle and Metro agreed that first priority should be given to controlling overflows into Lake Washington. As a result, the only project proposed for Denny in the 1979 plan was an extension of the overflow discharge pipe to move overflows away from the shoreline; this project was never completed.

The following subsections describe the CSO planning process completed to date by King County (as successor agency to Metro) and Seattle. Ecology and King County continue to review the effects of CSO projects on the overall system flows and refine the requirements for CSO control based on the most recent modeling, flow and water quality data.

2.3.1 King County CSO Planning Process

The King County service area was developed according to a 1958 Comprehensive Plan, *Metropolitan Seattle Sewerage and Drainage Survey* (Brown and Caldwell 1958), which was part of Metro's original charter. That plan outlined the staged construction of major sewer trunks and interceptors, pump stations, and treatment plants. The *1958 Plan* has been amended several times, with the last major amendment occurring in 1986.

A 1985 amendment to the Washington State Water Pollution Control Act (Chapter 90.48 RCW), required all cities with CSOs to provide "the greatest reasonable reduction of combined sewer overflows at the earliest possible date" (RCW 90.48.480). Metro completed the *1985 Final Plan and SEPA EIS for CSO Control* (Culp et.al. and Metro 1985)). The Metro Council amended the *1985 Plan* in 1986, after completion of the *1986 Final Supplemental Plan and SEPA EIS for CSO Control* (Culp et. al. and Metro 1986) to include upgrading to secondary treatment and reduce CSO volumes by 65 percent.

In January 1987, Ecology defined "the greatest reasonable reduction" to mean "control of each CSO such that an average of one untreated discharge may occur per year" and set this as a long-term goal without defining a specific target date (WAC 173-245-020 (22)). At the same time, Ecology recognized that such a limit could not be achieved in the short term and agreed that reducing CSO volumes by 75 percent system-wide by the end of 2005 was a reasonable interim goal for Metro. Metro's *Final 1988 Combined Sewer Overflow Control Plan* (CWC-HDR et. al. and Metro 1988) described modifications made to previously-identified CSO projects following the *1986 Plan* and representative CSO projects to achieve Ecology's requirement of a 75 percent CSO volume reduction in the overall service area over the next 20 years. It also identified CSO projects that could be added to this 20-year plan to achieve the ultimate goal of one untreated CSO event per outfall per year. That plan was approved by Ecology on August 8, 1988.

In November 1996, Ecology granted King County's request to reconsider the 1988 agreement (Fricke 1996). The request is based on the higher costs and additional projects required to reach the goal that were not anticipated in the *1988 Plan*. Ecology agreed that a revised schedule will be determined in the year 2000, but projects already scheduled for the 1995-2000 period should proceed (i.e., Alki, Denny, Henderson/Martin Luther King, Harbor, and Norfolk). In addition, the *Draft Water Quality Assessment* (King County Metro 1995b), a study to assess water and sediment quality in the Duwamish River and Elliott Bay, should be completed prior to a final decision on schedule.

Ecology regulations (WAC 173-245-040) require CSO plans to be updated with each new NPDES permit renewal. The *Combined Sewer Overflow Control Plan 1995 Update* (Brown and Caldwell/KCM and KCWPC 1995a) served as the required update of the *1988 Plan* in compliance with regulatory requirements. The update included an assessment of the effectiveness of CSO reduction efforts to date, a re-evaluation of priority for CSO sites, and a list of projects for the following five years.

Denny Project Planning. The 1985 *FEIS* included plan-level environmental analysis of alternative approaches to controlling the Denny Way CSO, including a treatment facility, Denny Way storage, Denny Way tunnel/partial separation, and Denny local partial separation. The 1986 *FSEIS* addressed the environmental impacts and mitigation measures associated with storage facilities and sewer separation. The 1995 *Update* proposed a tunnel for storage, storage tank, treatment facility and associated piping, and stated that Metro and Seattle were conducting a project-level NEPA and SEPA environmental evaluation of the joint project.

The 1986 comprehensive CSO Plan amendment, which the Metro Council adopted by Resolution 4780, called for a storage and treatment approach for controlling Denny overflows. The 1988 *Plan*, however, recommended a partial separation project in the Denny and Denny Local basins, to be complemented by an assumed Seattle partial separation upstream of the existing Lake Union Tunnel. Subsequent to the 1988 *Plan*, Metro reassessed the Denny project in light of changes in the regulatory environment and progress made in its CSO control program, as further discussed below.

2.3.2 Seattle CSO Planning Process

At the same time Metro was developing its 1988 *Plan*, Seattle was preparing its 1988 *CSO Control Plan* (Brown and Caldwell and Seattle Engineering Department 1988). Partial separation, transport, storage and combinations of the three were alternatives for the Lake Union Basin. *Seattle's 1988 FEIS* addressed the environmental impacts and mitigation measures associated with these plan alternatives. The recommended alternative included partial separation of part of the East Lake Union Basin and construction of a large storage tank near the south end of Lake Union. This proposed tank would drain to Metro's existing Lake Union Tunnel, which conveys sewage from the south Lake Union area to the Denny Way Regulator Station. In later predesign studies, Seattle developed a plan for the area east and south of Lake Union that proposed to convey flows to the south end of the lake instead of separating storm and wastewater sewers in the area. The later plan called for CSO flows to be stored in a larger tank in south Lake Union; however, there was concern whether capacity existed in Metro's EBI to convey these stored flows to West Point for treatment and whether release of the large volume of stored sewage would increase Metro's overflow volumes at the Denny Way Regulator Station. As a result, Seattle re-evaluated its CSO plan. In 1991, Seattle Drainage and Wastewater Utility (DWU) requested that Metro participate in a joint alternative analysis to find ways to control discharges into Lake Union from Seattle's system and into Elliott Bay at the Denny Regulator from Metro's system.

2.3.3 Joint CSO Planning Process

In both Metro's and Seattle's 1988 CSO Control Plans, it was recognized that a close hydraulic relationship exists between the facilities owned and managed separately by Seattle and Metro. The Denny and Lake Union basins are one example of that important relationship. Further study indicated the potential for both agencies to optimize CSO control through joint planning; without such planning it was possible for either agency to limit the options of the other and potentially cause increases in CSO discharges to Lake Union or Elliott Bay.

Seattle and Metro began developing the joint Denny Way/Lake Union CSO Control Project in 1991. The intention was to consider King County and Seattle facilities as a single unit in recognition of the close hydraulic connection between facilities and to maximize the ability of both agencies to improve water quality. The City of Seattle and King County entered into a formal agreement on October 23, 1995, specifying how a joint project would be implemented by both jurisdictions. The joint project would allow the parties to pool their resources to design and construct the best system-wide solution.

2.4 DENNY BASIN COMBINED SEWER OVERFLOWS

The Denny Basin is a large urban area (parts of the Seattle neighborhoods of Queen Anne, Eastlake, Capitol Hill, the Denny Regrade, and the South Lake Union area) served by combined sewers. The basin is divided into two subbasins: South Lake Union and Elliott Bay (Figure 2-6). Over the years, the basin has experienced intensive development which covered permeable soils with streets, driveways, parking lots, and rooftops. These surfaces shed rainwater rather than absorb it. As a result, the combined sewer flows during periods of heavy precipitation have increased. To reduce CSOs, components which maximize the capacity of the sewer system have been added. However, these capacity improvements have not kept pace with the increasing volume of storm runoff. The city also requires new development to detain stormwater to a certain standard.

Overflows through the Denny Way CSO represent about 20 percent of the total annual CSO into the Duwamish and Elliott Bay waters. The Denny Way Regulator Station is a logical location for CSO control facilities because three major conveyance systems converge at the regulator site. Additionally, the Denny Basin lies near the downstream end of the EBI, which conveys combined sewage to the West Point Treatment Plant from as far south as South Norfolk Street in the south Duwamish industrial area.

During rain storms, the combined wastewater and stormwater from the south fill the EBI, leaving no room for flows from the Denny Basin. At such times, virtually all the combined sewage from the Denny Basin reaching the Denny Way Regulator Station overflows into Elliott Bay along the shoreline in Myrtle Edwards Park. To the east and upstream from the King County facilities, large overflows also occur into Lake Union from facilities operated by Seattle and King County. Figure 2-6 shows the location of CSOs and existing combined sewer system components pertinent to the Denny/Lake Union Project.

The Lake Union CSOs are Seattle's largest remaining uncontrolled CSOs and discharge an average annual volume of 86 MG. These CSOs are closely linked to King County's Denny Way Regulator Station. The Denny Way CSO is King County's largest remaining uncontrolled CSO and currently discharges an average annual volume of approximately 450 MG to Elliott Bay. The Dexter Avenue CSO, the only King County overflow into the southern portion of Lake Union, discharges an average annual volume of 15 MG. Yearly CSO discharges from the Denny Basin total approximately 506 MG.

Figure 2-6

2.5 OVERVIEW OF JOINT PROJECT

In March 1992, Seattle submitted a design memorandum for the Lake Union Combined Sewer Overflow Control Plan to Ecology to secure design grant funds from the state Centennial Clean Water Program. The report recommended an improved combined sewer conveyance system and construction of a storage tunnel between the lower Lake Union area and EBI. The design memorandum was approved by Ecology in June 1992.

Also in 1992, Metro hired Brown and Caldwell to conduct a feasibility study to analyze storage and treatment alternatives for a joint Seattle/Metro project (Brown and Caldwell and Metro 1992). The study assumed improved transport of flows from Seattle's system on the east side of Lake Union. The highest ranked alternative included a CSO treatment plant at Denny Way with a new deep water outfall, extension of the existing Denny Way CSO outfall to provide for discharge away from the Myrtle Edwards beach, and a new CSO conveyance/storage tunnel.

In 1993, Metro began a planning level analysis for the Denny Way portion of the joint project as part of a system-wide update of Metro's CSO Control Plan and the RWSP. The analysis of the Denny Way CSO was again considered as a single unit with Seattle's facilities at Lake Union. The planning for the Denny Way CSO was accelerated both to take advantage of the opportunity to maximize CSO control presented by a joint project, and to be prepared to make an application for a federal Infrastructure Grant of \$35 million. The grant was awarded to King County Metro for the joint project in 1995 with Seattle as a subgrantee.

Together, the constructed alternative for Phase 1 and the Preferred Alternative for Phases 2 and 3/4 of the Denny/Lake Union Project meet the 1991 objectives established by Metro and Seattle for CSO reduction. Since the Facilities Plan for Phase 1 was approved, the Denny/Lake Union Project has been refined from completion of Phases 1, 2, and 3 to achieve a 50-percent reduction in CSOs to completion of Phases 1, 2 and a combined 3/4 to control the affected CSOs to one overflow per outfall per year.

Different elements of the project are at varying stages in the planning, design and environmental process, so the project is divided into the following phases:

Phase 1

Phase 1 involves replacement and enlargement of the combined sewer line along the east side of Lake Union to accommodate higher combined sewer flows and, after construction of Phases 2 and 3/4, to control CSOs during rainstorms. This phase was designed by Seattle and SEPA and NEPA review was completed by Seattle in 1995. Construction of Phase 1 began in February 1996 and completed in 1997.

Phase 2

Phase 2 involves completion of Seattle's combined sewer enlargement connecting Phase 1 and King County's Phase 3/4 project in south Lake Union. Design and construction of this section will be completed by Seattle and are dependent on King County's Phase 3/4 project. Environmental documentation for this phase is included in this final joint document.

Phase 3/4

This combined phase involves construction of CSO facilities to reduce CSO volumes discharged at the Denny Way Regulator Station to one untreated overflow per year. This phase will be designed and constructed by King County. Environmental documentation for this phase is included in this final joint document.

Each of the Denny/Lake Union Project phases will be implemented by the party that will have ultimate ownership and operating responsibility for the facilities involved, regardless of the shared financial responsibility. The implementation, financial and ownership/maintenance responsibilities are summarized in Table 2-1.

Table 2-1
Ultimate Owners and Responsible Parties for Project Facilities

Phase	Description	Responsibility		
		Implement	Financial	Own/Operate
1 (1995-1997)	Enlarge combined sewer pipes along eastern side of Lake Union.	Seattle	Seattle	Seattle
2 (1995-2000)	Continuation of Phase 1 in south Lake Union and connecting to King County Phase 3/4 facilities.	Seattle	Seattle	Seattle
3/4 (1995-2003)	Reduction in CSOs at Denny Way Regulator Station to one untreated overflow per year. Preferred Alternative: storage tunnel, pump station, floatables control, disinfection/dechlorination, submarine outfall, existing outfall extension, flow regulators, connecting pipelines.	King County	Shared Capital Costs; King County/ Seattle	King County

Pre-design for the Phases 2 and 3/4 facilities has begun; final design will begin in 1998 and construction will begin in the year 2000. Project construction for Phases 2 and 3/4 is scheduled to be completed by the end of 2003. Documents issued for the Denny/Lake Union Project to date are listed in Appendix A. This document will serve as SEPA and NEPA environmental documentation for Phases 2 and 3/4.

2.6 OTHER PLANS AND PROJECTS

Various current and proposed programs, plans and projects supported by agencies and commercial interests could affect or be affected by the Denny/Lake Union Project. These programs, plans and projects are listed below. Appendix B includes additional details for some projects.

The potential cumulative impacts from construction and operation of the Denny/Lake Union Project and these other projects are described in Chapter 9 of this document. Figure 2-7 outlines the general project areas for other plans and projects.

2.6.1 Project Area

Regional Wastewater Services Plan. The RWSP is a long-range comprehensive planning effort by King County to identify wastewater facilities and services that the King County wastewater service area will need over the next 30 years. The final RWSP and environmental impact statement were issued on April 27, 1998. Adoption by the Metropolitan King County Council is expected in late 1998. The project area for the RWSP includes most of western King County and the portion of southern Snohomish County in King County's wastewater service area.

2.6.2 South Lake Union Area

UNOCAL Remediation in South Lake Union. In 1980, an underground gasoline leak was discovered on the UNOCAL gas station property at Westlake Avenue and Mercer Street. The gasoline plume is located in the block of Terry, Valley, Westlake and Mercer. Approximately 40,000 gallons of gasoline was collected as free product. UNOCAL is responsible for the clean up with Ecology monitoring the actions. Vapor extraction has occurred since 1989. Currently, no petroleum vapors are detected, however, explosive levels (20 to 30 percent) of methane have been detected. It appears that methane is a problem in the area due to degrading sawdust, wood chips and organic pieces in old lake sediments. Vapor extraction and groundwater monitoring by UNOCAL will continue until levels are determined to be safe by Ecology.

Southeast Lake Union - Seattle's CSO 126B. Although this area is tributary to the Denny Way Regulator Station, Seattle intends to eliminate the connection between the combined sewer and the storm drain as a separate project.

Mercer Corridor Improvements. The last proposed Mercer Corridor solution was tied to the defeated Commons proposal for a 6-lane roadway about a half block north of Mercer Street. At Seattle's request, King County conducted a feasibility study (King County et.al. 1996) to evaluate a potential combined project that would incorporate a CSO storage tank under the realigned Mercer Street. The conclusions of this study were that significant cost savings are unlikely to result from combining the projects and a combined project offers no significant advantages to the Denny/Lake Union Project Preferred Alternative. Without a Seattle Commons proposal, the Mercer project is not being actively pursued by the City.

Figure 2-7

Regional Transit Authority, Light Rail. The Regional Transit Authority (RTA) is currently pursuing predesign and environmental analysis of alternatives for a Light Rail line between the University District and Sea Tac through downtown Seattle. One of the alternatives would tunnel down Eastlake Avenue East and then swing west paralleling Mercer Street to the Seattle Center and then swing southeast into downtown. This alternative is not the Preferred Alternative for the light rail line.

Roy Street Underpass. Several Mercer Corridor proposals included a Roy Street Underpass of Aurora Avenue North as a key link. The Denny/Lake Union Project tunnel design would leave the proposed corridor available for future street improvements by specifying a minimum depth for the tunnel, should an underpass become part of an approved Mercer Corridor project.

Fred Hutchinson Cancer Research Center. The Fred Hutchinson Cancer Research Center is planning a third phase of construction near the southeast corner of Lake Union. Phase 3 is planned to include a third office/lab building of approximately five to six stories high at Eastlake Avenue East and Aloha Street. No start date is set for Phase 3.

Marriott Hotel. The new 250-room Marriott Hotel project is constructing on a triangular-shaped lot at 925 Westlake Avenue North, north of Aloha Street and between Westlake and Eighth Avenue North. The 208,000 square-foot hotel will include 153 stall belowgrade parking garage and a limited-service restaurant.

Westlake Drainage Rehabilitation and West Lake Union Trail. The Westlake Drainage Rehabilitation Project is proposed to replace and rehabilitate 15 small storm drain systems, collecting runoff from Westlake Avenue North between Galer and Nickerson streets. The drainage project will be combined with the West Lake Union Trail Project, a multi-use pathway along abandoned railroad right-of-way on the west shore of Lake Union, parallel to Westlake Avenue from the Fremont Bridge to South Lake Union Park. Construction is anticipated to occur in 1999.

South Lake Union Planning Association. The South Lake Union Planning Association is currently looking at transportation and parks and open space issues in the area. No studies or projects have been funded.

2.6.3 Elliott Bay Area

Elliott Bay/Duwamish Restoration Program (EBDRP). This program was established by the U.S. Government (Departments of Commerce and Interior), the State of Washington (Department of Ecology), the Muckleshoot Indian Tribe, the Suquamish Indian Tribe, and the City of Seattle and King County through a 1991 Consent Decree following a lawsuit against the Seattle and Metro initiated by U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). System-wide planning for CSO control must take the Consent Decree into account to the extent that individual CSO control projects impact sediment and habitat restoration.

401 Elliott West Office Complex Project. The 401 Elliott West Project is a proposed office and lab complex of three buildings located east of Myrtle Edwards Park and immediately south of and adjacent to the Elliott West site on the west side of Elliott Avenue West. The project will consist of three, five-story office buildings totaling 317,000 square feet, and a belowgrade parking structure for approximately 620 vehicles. The first building is scheduled for completion in late 1998. The two other buildings should be completed in late 2000.

BINMIC Plan. The Ballard/Interbay/Northend Manufacturing/Industrial Center (BINMIC) Plan is proposing alternative approaches to achieve Seattle's employment growth targets for the BINMIC and to maintain and promote the area as a thriving manufacturing industrial center. The BINMIC consists of 971 acres of waterfront and upland property located northwest of downtown Seattle. The draft EIS and plan were issued in May 1997 (BINMIC Planning Committee 1997). The area has surface and/or groundwater pollution along the BINMIC waterfront. The plan hopes that contaminated site cleanup, decrease in CSOs, enforcement of stormwater and wastewater regulations, and stronger efforts by businesses to reduce or treat discharges will improve the quality of BINMIC waters over time.

Vine Street Basin. Vine Street is a Seattle basin located along the waterfront from Bell Street to Vine Street. Overflows from this area will be controlled by a future Seattle project.

Immunex Headquarters Project. The Immunex Headquarters Project is proposed for Pier 88. Site preparation for the project would involve hauling excavated soils from the site and importation of fill material which could cause cumulative traffic impacts with the Denny/Lake Union Project on Elliott Avenue and Denny Way, depending upon project scheduling. Construction is scheduled to begin in 1999 and would take 18 to 30 months to complete.

West Galer Street Flyover. The West Galer Street Flyover is a City of Seattle proposed project to construct a grade-separated access to Terminals 88, 89, 90, and 91 over the mainline Burlington Northern Railroad tracks and Alaskan Way West along the West Galer Street right-of-way. Construction is anticipated to begin in 2000 and should be completed in 2001.

Waterfront Streetcar Extension Study. The Waterfront Streetcar Extension Study is not currently funded by the City of Seattle. Once funded, the study will look at extending the waterfront streetcar from Alaskan Way to the Seattle Center and possibly South Lake Union area.

Workshops. The property directly across Elliott Avenue from the project and just north of West Mercer Place is proposed to be developed as workshops. The workshops will be for lease and include electricity, water and sewer. Construction is expected to be completed in 1998.

Condominium Project. The property behind the Workshops property is planned to be developed into condominiums. Construction is expected to begin in 1998.